CATERPILLAR

SERVICE MANUAL

228 SKID STEER LOADER

Printed by
Heavy Equipment Manuals
v2.20

Printed in U.S.A

Heavy Equipment Manuals

This is the sample of the manual
click on
the download link for complete
manual

DOWNLOAD LINK

For some reason if link does not work
download this pdf and then click

Disassembly and Assembly 2
General Service Information 680
Schematic 783
Specifications 861
Systems Operation 1077
Testing and Adjusting 3275
Torque Specifications 3378
Troubleshooting 3429

RENR2853-02 228 Skid Steer Loaders Engine Supplement 2
RENR2857-02 226 and 228 Skid Steer Loaders Powertrain 113
RENR2887-01 228 Skid Steer Loader Machine Systems 190
SENR5013-08 3034 Engine for Caterpillar Built Machines 355
UENR3262-00 Seal Installation 616

https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 2
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 6
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 10
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 13
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 20
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 24
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 37
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 50
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 55
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 59
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 63
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 67
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 71
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 75
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 85
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 95
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 103
https://127.0.0.1/sisweb/sisweb/techdoc/techdoc_print_page.jsp? _ 107

Product: SKID STEER LOADER
Model: 228 SKID STEER LOADER 6BZ
Configuration: 216 226 228 Skid Steer Loader 6BZ00001-00699 (MACHINE) POWERED BY 3034 Engine

Disassembly and Assembly
216, 226 and 228 Skid Steer Loaders Engine Supplement
Media Number -RENR2853-02 **Publication Date -01/08/2001** **Date Updated -16/11/2001**

i01293705

Air Cleaner - Remove and Install

SMCS - 1051-010

Removal Procedure

1. Open the engine access door.
2. Release the latch on the radiator. Raise the radiator. This will allow access to the air cleaner.

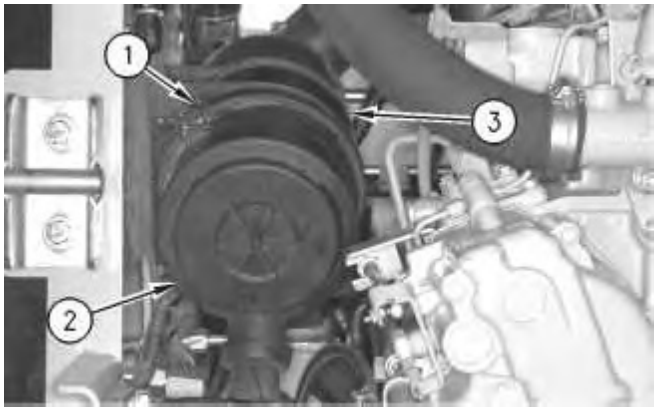

Illustration 1 g00566975

3. Disconnect two clamps (1). Remove air cleaner housing cover (2) from air cleaner housing (3) .
4. Remove the air filter from inside air cleaner housing (3) .

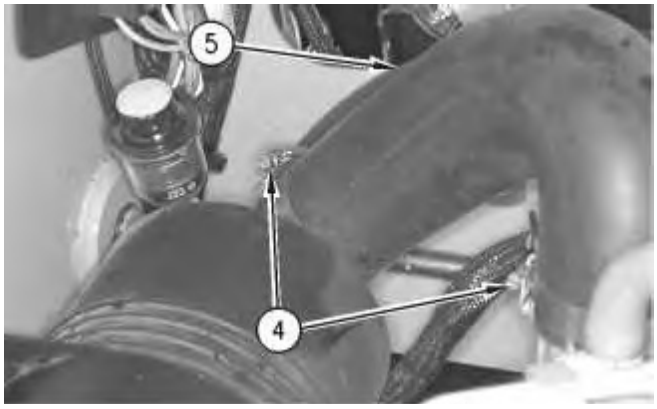

Illustration 2 g00566976

5. Remove two hose clamps (4). Remove air hose (5) .

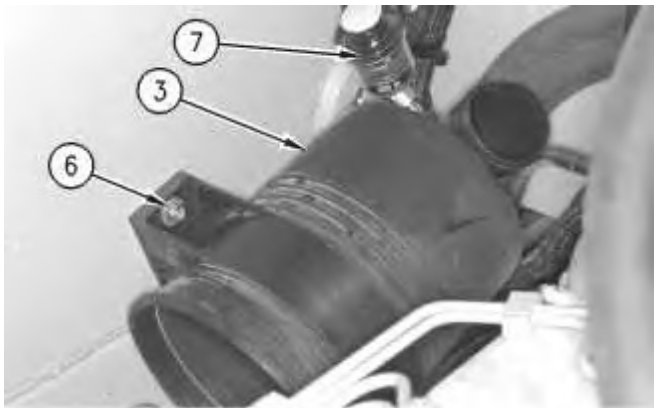

Illustration 3 g00566979

6. Remove two bolts (6) .
7. Remove air cleaner housing (3) .
8. Remove service indicator (7) .

Installation Procedure

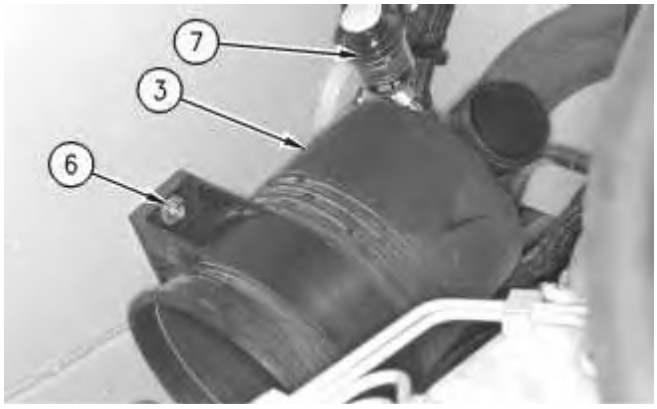

Illustration 4 g00566979

1. Install service indicator (7) into air cleaner housing (3) .
2. Clean any debris or dirt from air cleaner housing (3) prior to installation.
3. Place air cleaner housing (3) into position. Install two bolts (6) in order to secure air cleaner housing (3) to the side of the machine.

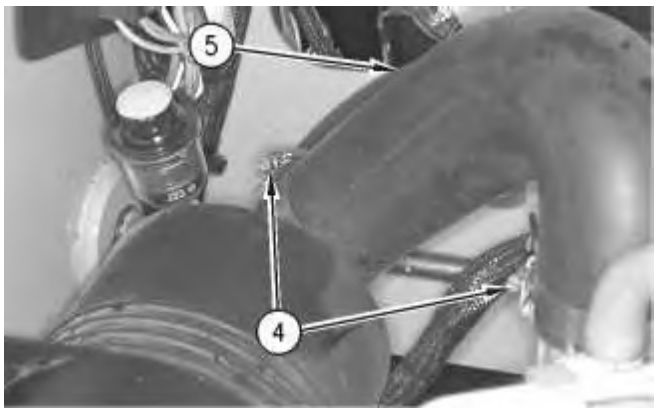

Illustration 5 g00566976

4. Install hose (5). Secure hose (5) with two hose clamps (4) .

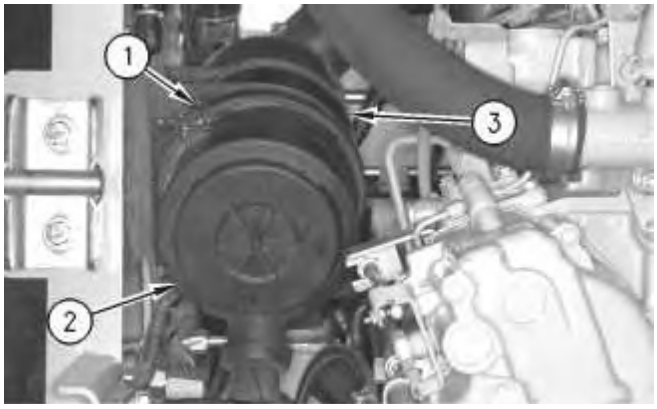

Illustration 6 g00566975

5. Install the air filter into air cleaner housing (3) .
6. Install air cleaner cover (2) .
7. Connect two clamps (1) .
8. Start the engine and check for air leaks.
9. Turn the engine to the OFF position. Lower the radiator and lock the radiator into position.
10. Close the engine access door.

Copyright 1993 - 2020 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.
Sun Jan 12 13:33:43 UTC+0530 2020

Product: SKID STEER LOADER
Model: 228 SKID STEER LOADER 6BZ
Configuration: 216 226 228 Skid Steer Loader 6BZ00001-00699 (MACHINE) POWERED BY 3034 Engine

Disassembly and Assembly
216, 226 and 228 Skid Steer Loaders Engine Supplement
Media Number -RENR2853-02 **Publication Date -01/08/2001** **Date Updated -16/11/2001**

i01596954

Alternator - Remove and Install

SMCS - 1405-010

Removal Procedure

1. Open the engine access door.
2. Release the latch on the radiator. Raise the radiator. This will allow access to the alternator.
3. Remove battery cables from the battery. Refer to Disassembly and Assembly, "Battery and Battery Cable - Seperate and Connect".

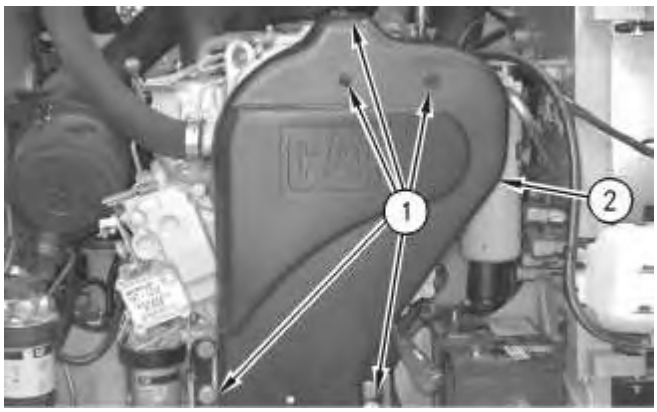

Illustration 1 g00686047

4. Remove five bolts (1).
5. Remove pulley cover (2) from the front of the engine.

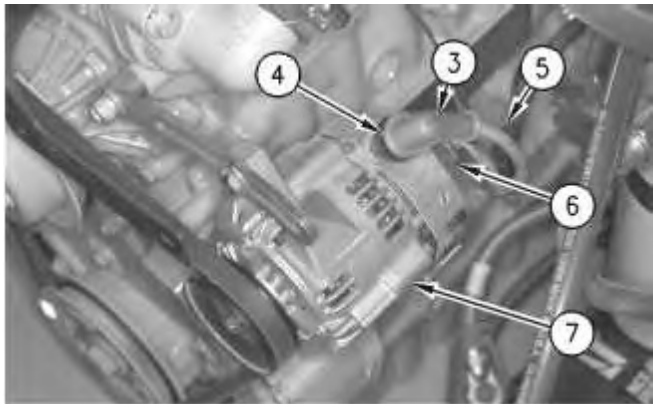

Illustration 2 g00686053

6. Remove rubber boot (3). Remove nut (4) and remove wire (5) from the alternator.
7. Remove electrical connection (6) from the back of alternator (7) .

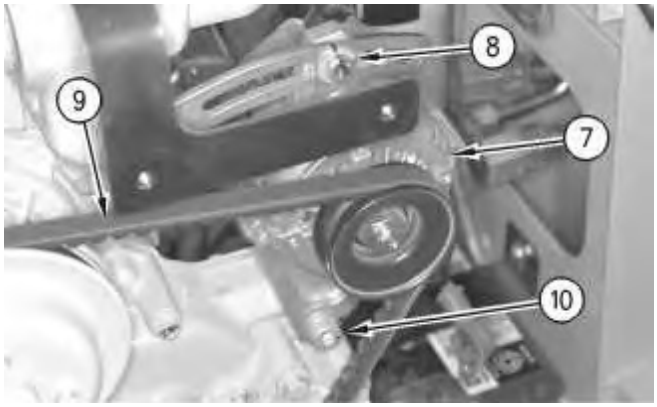

Illustration 3 g00686057

8. Remove bolt (8). Move alternator (7) in order to release alternator belt (9) .
9. Remove alternator belt (9) from the alternator. Remove bolt (10) and remove alternator (7) .

Installation Procedure

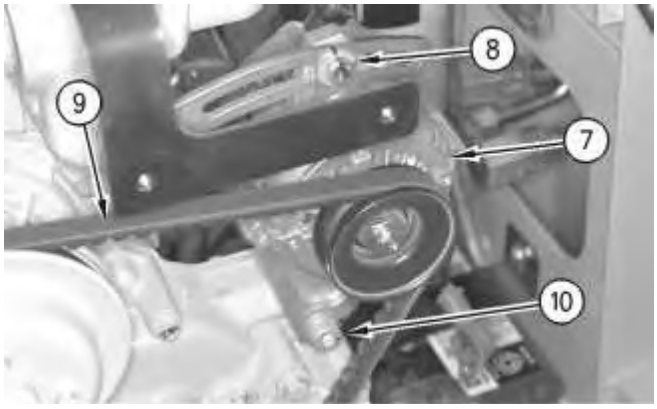

Illustration 4 g00686057

1. Install alternator (7) and install bolt (10) .
2. Install alternator belt (9) on the alternator pulley.

   Note: Refer to the Operation and Maintenance Manual, SEBU7468 for the correct tightening procedure for the alternator belt.
3. Tighten bolt (8) when the proper belt tension is achieved.

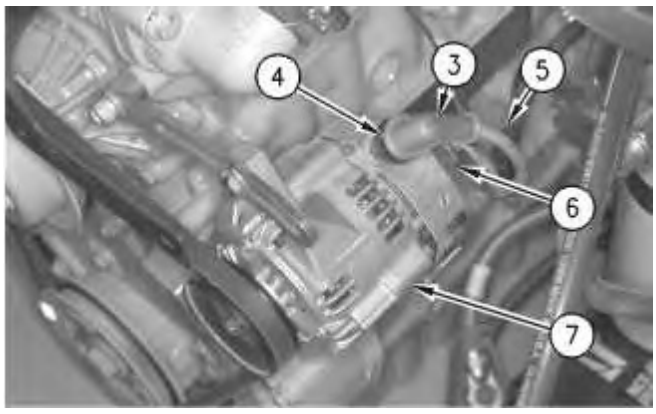

Illustration 5 g00686053

4. Install electrical connection (6) into the back of alternator (7) .
5. Install electrical wire (5) onto alternator (7). Secure wire (5) with nut (4). Install rubber boot (3) on top of nut (4) .

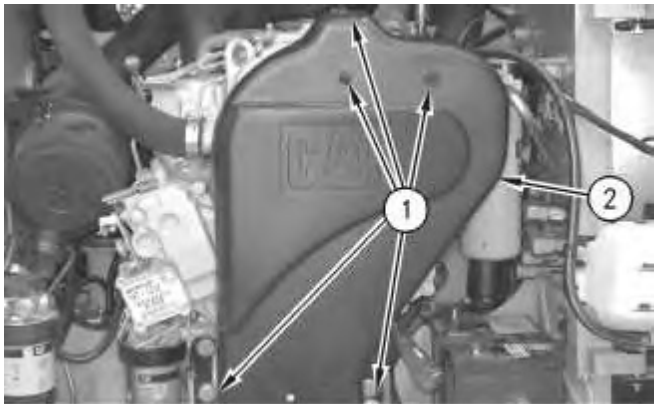

Illustration 6 g00686047

6. Install pulley cover (2) onto the front of the engine.
7. Secure pulley cover (2) with five bolts (1) .
8. Connect battery cables to the battery. Refer to Disassembly and Assembly, "Battery and Battery Cable - Seperate and Connect".

   Note: Check the condition of both the battery cables and the battery terminal posts. Clean both surfaces for a proper connection.
9. Start the engine.
10. Shut the engine OFF. Check the alternator belt for the proper tension.
11. Lower the radiator.
12. Close the engine access door.

Copyright 1993 - 2020 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.
Sun Jan 12 13:30:41 UTC+0530 2020

Product: SKID STEER LOADER
Model: 228 SKID STEER LOADER 6BZ
Configuration: 216 226 228 Skid Steer Loader 6BZ00001-00699 (MACHINE) POWERED BY 3034 Engine

Disassembly and Assembly
216, 226 and 228 Skid Steer Loaders Engine Supplement
Media Number -RENR2853-02 **Publication Date -01/08/2001** **Date Updated -16/11/2001**

i01463322

Battery and Battery Cable - Separate and Connect

SMCS - 1401-029

Separation Procedure

1. Lower the work tool to the ground.
2. Turn the engine start switch to the OFF position.
3. Open the engine access door.

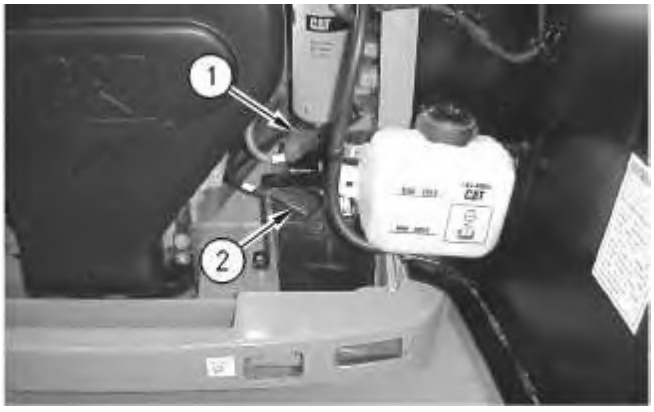

Illustration 1 g00594399

4. Raise the cover on the negative terminal of the battery. Disconnect negative terminal (2) of the battery. Place tape on the negative terminal of the battery.
5. Raise the cover on the positive terminal of the battery. Disconnect positive terminal (1) of the battery. Place tape on the positive terminal of the battery.

Illustration 2 g00795046

6. Remove two bolts (3). Remove bracket (4) on the battery.
7. Remove battery (5) .

Connection Procedure

Illustration 3 g00795046

1. Install battery (5) in position in the machine.

   Note: Both battery terminals must be next to the engine.

2. Install bracket (4). Secure bracket (4) with two bolts (3) .

This is the sample of the sample click on
the download link for complete manual

DOWNLOAD LINK

For some reason if link does not work download this pdf and then click

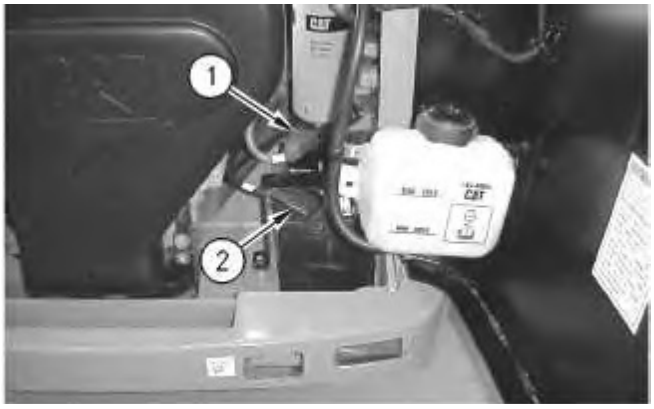

Illustration 4 g00594399

3. Remove the tape from the positive terminal of the battery. Connect the positive terminal (1) of the battery. Lower the cover on the positive terminal of the battery.
4. Remove the tape from the negative terminal of the battery. Connect the negative terminal (2) of the battery. Lower the cover on the negative terminal of the battery.
5. Close the engine access door.

Copyright 1993 - 2020 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.
Sun Jan 12 13:30:25 UTC+0530 2020

Product: SKID STEER LOADER
Model: 228 SKID STEER LOADER 6BZ
Configuration: 216 226 228 Skid Steer Loader 6BZ00001-00699 (MACHINE) POWERED BY 3034 Engine

Disassembly and Assembly
216, 226 and 228 Skid Steer Loaders Engine Supplement
Media Number -RENR2853-02 **Publication Date -01/08/2001** **Date Updated -16/11/2001**

i01715326

Cab - Tilt

SMCS - 7301-029

Procedure to Tilt the Cab

Start By:

A. Release the hydraulic system pressure. Refer to Disassembly and Assembly, "Hydraulic System Pressure - Release".

WARNING

Do not go beneath cab unless cab is empty and support lever is engaged.

Failure to follow the instructions or heed the warnings could result in injury or death.

Note: Empty the water tank (if equipped) before you tilt the cab.

Illustration 1 g00601508

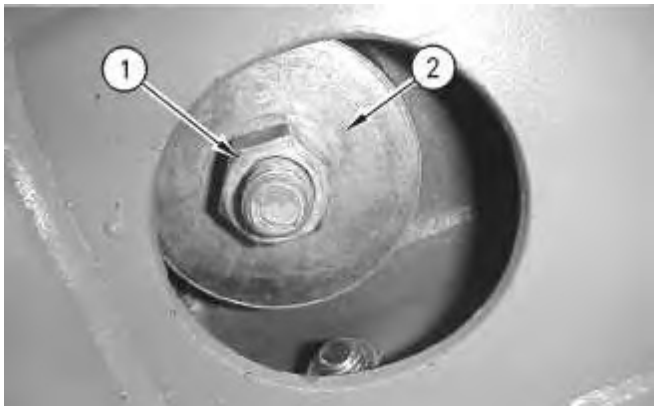

Illustration 2 g00597525

1. Remove nut (1) and large washer (2) from the inside of the cab.

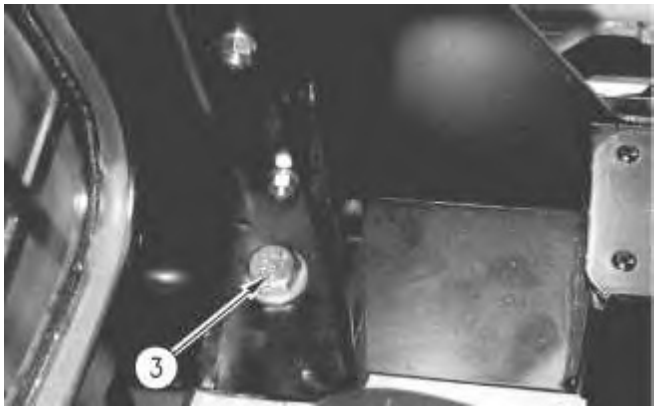

Illustration 3 g00597551

2. Remove bolt (3) .
3. Repeat Steps 1 and 2 on the opposite side of the cab.

Illustration 4 g00597554

4. Raise cab (4) .

Illustration 5 g00601451

Illustration 6 g00563598

5. Engage cab support lever (5) .

Lower Procedure

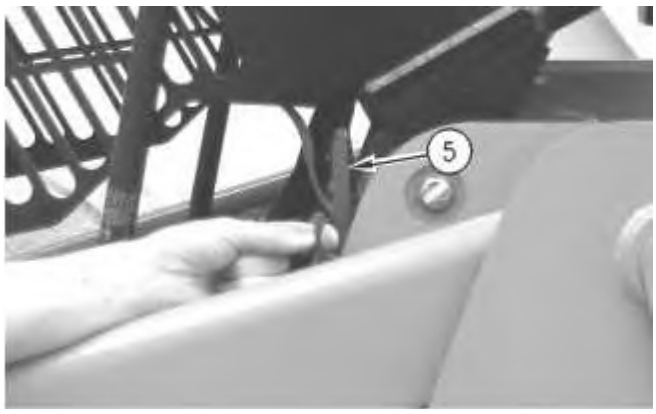

Illustration 7 g00601456

Illustration 8 g00563674

1. Tilt the cab upward.
2. Disengage cab support lever (5) .

Illustration 9 g00601528

3. Lower cab (4) .

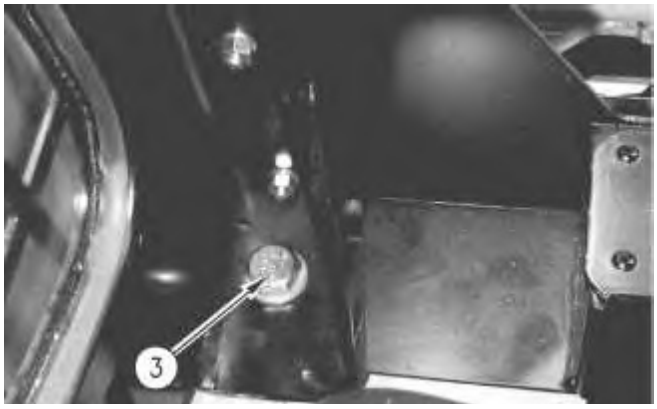

Illustration 10 g00597551

4. Install bolt (3) .

Illustration 11 g00601508

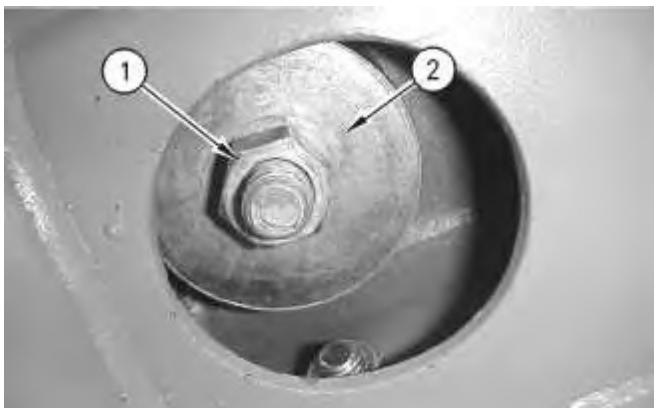

Illustration 12 g00597525

Note: Ensure that the large washer is between the nut and the rubber mounting.

5. Install large washer (2) and nut (1) from the inside of the cab. Tighten the nuts to a torque of 125 ± 10 N·m (92 ± 7 lb ft).

6. Repeat Steps 4 and 5 on the opposite side of the cab.

Copyright 1993 - 2020 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.

Product: SKID STEER LOADER
Model: 228 SKID STEER LOADER 6BZ
Configuration: 216 226 228 Skid Steer Loader 6BZ00001-00699 (MACHINE) POWERED BY 3034 Engine

Disassembly and Assembly
216, 226 and 228 Skid Steer Loaders Engine Supplement
Media Number -RENR2853-02 **Publication Date -01/08/2001** **Date Updated -16/11/2001**

i01293868

Electric Starting Motor - Remove and Install - 228 Skid Steer Loader

SMCS - 1453-010

S/N - 6BZ1-UP

Removal procedure

1. Release the pressure in the hydraulic system. Refer to Disassembly and Assembly, "Hydraulic System Pressure -Release".
2. Open the engine access door.
3. Release the latch on the radiator. Raise the radiator. This will allow access to the electric starting motor.
4. Remove battery cables from the battery. Refer to Disassembly and Assembly, "Battery and Battery Cable - Seperate and Connect".

   Note: Put identification marks on all lines, hoses, wires, and tubes for installation purposes. Plug all lines, hoses, and tubes. This helps prevent fluid loss and contamination of the hydraulic system.

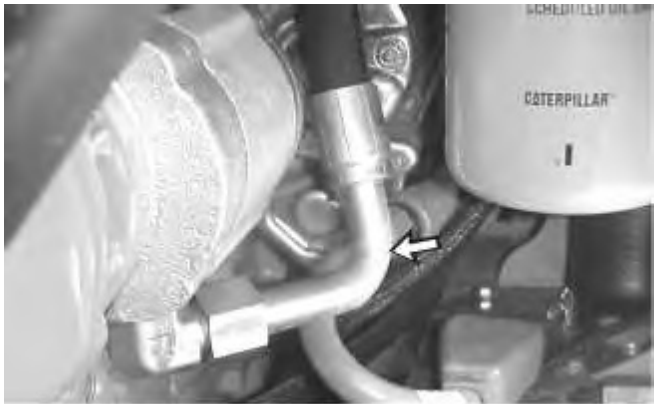

Illustration 1 g00685577

5. Remove hydraulic hose from the pump.

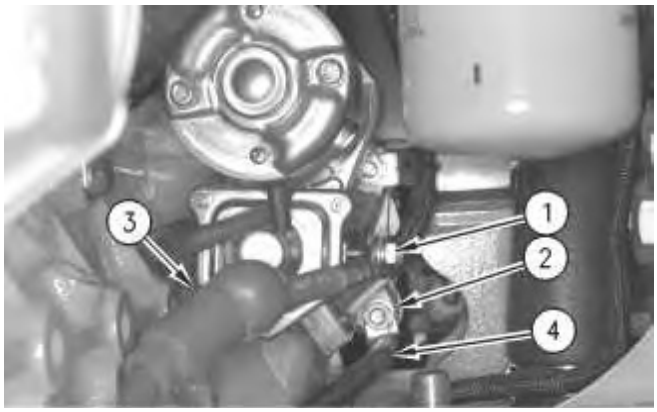

Illustration 2 g00686076

6. Remove nut (1) and the washer. Remove positive cable (3) of the battery.
7. Remove nut (2) and the washer. Remove negative cable (4) of the battery.

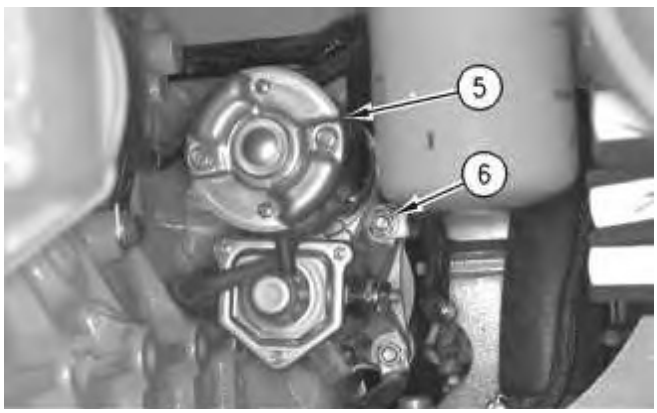

Illustration 3 g00686079

8. Support the electric starting motor (5) in order to prevent the electric starting motor from falling. Remove nut (6) and the washer. Remove the clip from the stud.

9. Remove electric starting motor (5) from the engine.

Installation Procedure

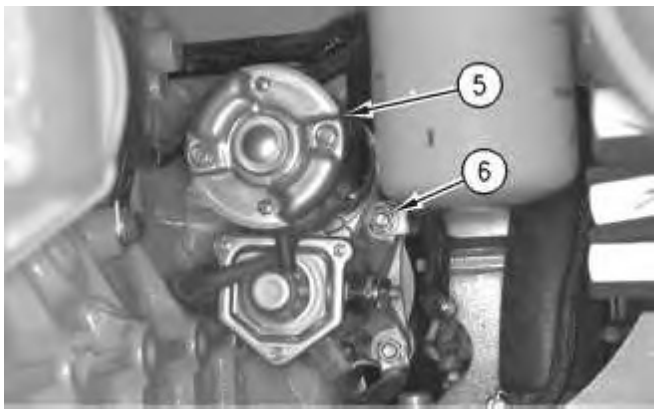

Illustration 4 g00686079

1. Install electric starting motor (5) onto the flywheel housing.

2. Install the clip. Install the washer and the nut (6) in order to secure the electric starting motor.

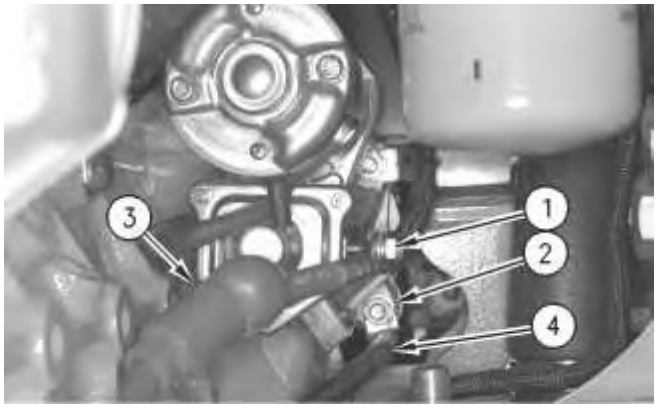

Illustration 5 g00686076

3. Install negative cable (4) of the battery. Secure negative cable (4) and the starter with washer and nut (2) .

4. Install positive cable (3) of the battery. Secure positive cable (3) with washer and nut (2) to the starter.

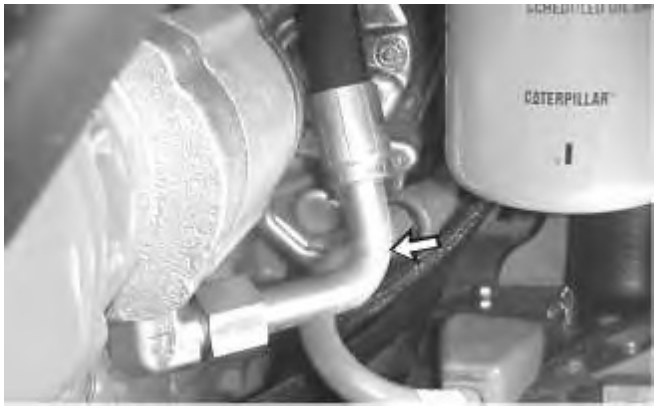

Illustration 6 g00685577

5. Connect hydraulic hose to the pump.
6. Connect battery cables to the battery. Refer to Disassembly and Assembly, "Battery and Battery Cable - Seperate and Connect".
7. Start the engine and check for proper operation of the starter.
8. Lower the radiator.
9. Close the engine access door.

Copyright 1993 - 2020 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.

Product: SKID STEER LOADER
Model: 228 SKID STEER LOADER 6BZ
Configuration: 216 226 228 Skid Steer Loader 6BZ00001-00699 (MACHINE) POWERED BY 3034 Engine

Disassembly and Assembly
216, 226 and 228 Skid Steer Loaders Engine Supplement
Media Number -RENR2853-02 **Publication Date -01/08/2001** **Date Updated -16/11/2001**

i01296335

Engine - Install

SMCS - 1000-012

Installation Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1U-9758	Jack Stand	2
B	6U-3145	Load Leveler	1
C	138-7575	Link Bracket	2
D	1U-9759	Jack Stand	1
E	1U-9760	Jack Stand	2

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

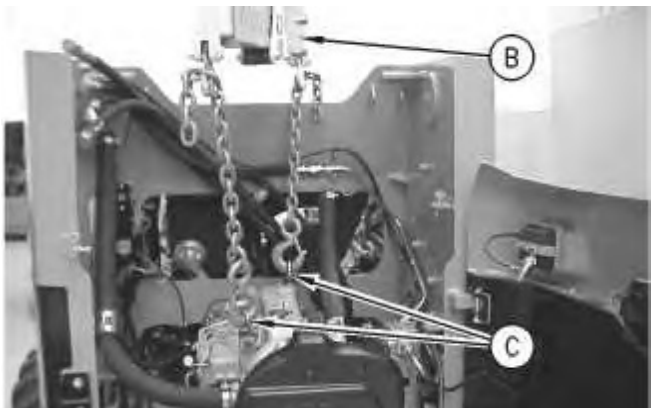

Illustration 1 g00593895

1. Attach Tooling (B) and Tooling (C) to the engine.

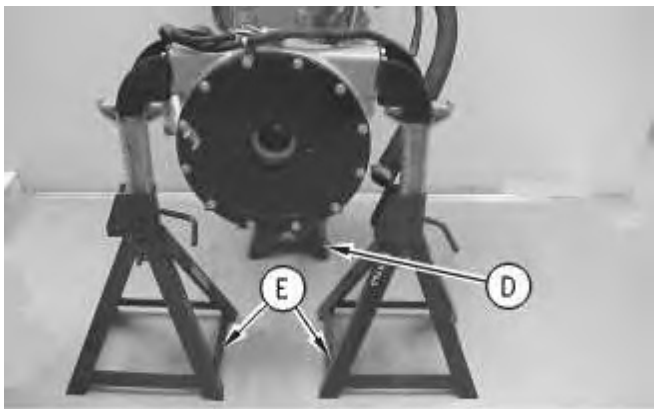

Illustration 2 g00593912

2. Raise the engine from Tooling (E) and Tooling (D). The weight of the engine and pump mount is 293 kg (645 lb).

Illustration 3 g00686909

3. Install the engine into the engine compartment slowly. Do not snag the wires during installation of the engine. Do not crush the hoses during installation of the engine. Align the coupling hub of the piston pumps (30). Engage the coupling hub of the piston pumps into the pump mounting.

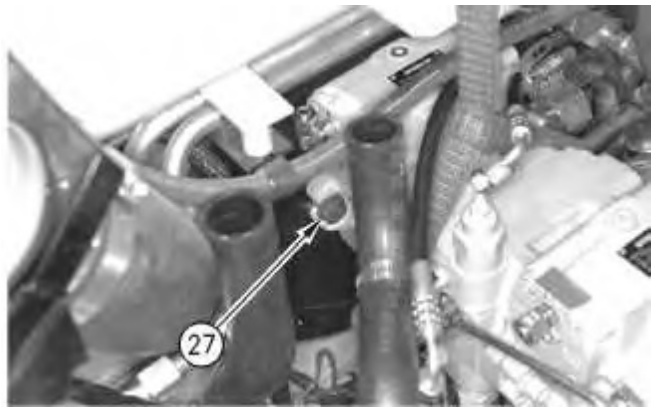

Illustration 4 g00686734

4. Install two bolts (27) that secure the piston pumps (30) to the pump mounting.

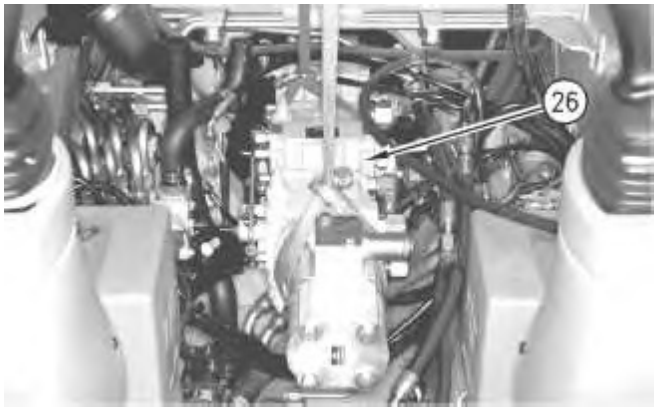

Illustration 5 g00686732

5. Remove the lifting device that was used to support piston pumps (26) .

Illustration 6 g00686741

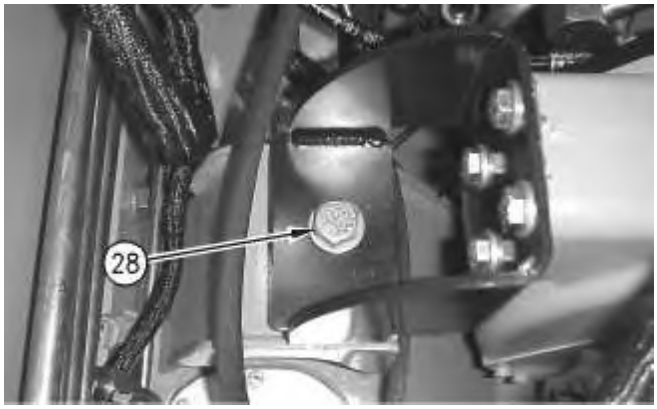

Illustration 7 g00686738

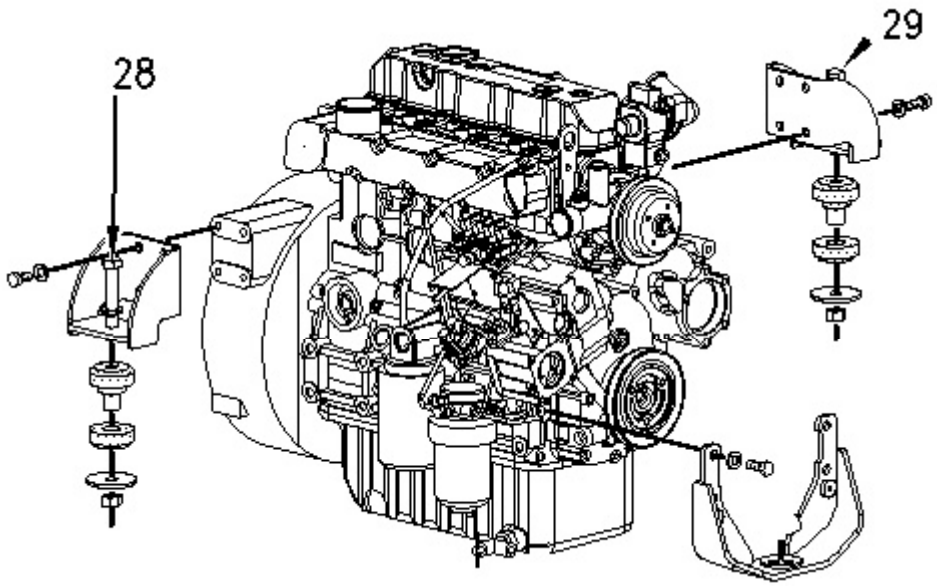

Illustration 8 g00686735

6. Align the rear of the engine with rubber mounts. Install bolts (28) and (29) into the motor mounts that secure the engine to the frame. Torque bolts (28) and (29) to 240 ± 40 N·m (177 ± 30 lb ft).

7. Install hoses, tubes and wires that were removed from the engine compartment prior to the installation of the engine.

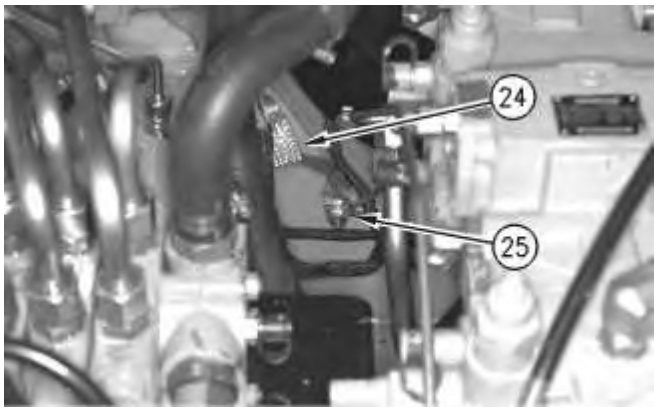

Illustration 9 g00686640

8. Install ground strap (24). Secure ground strap (24) with bolt (25) .

This is the sample of the sample click on
the download link for complete manual

DOWNLOAD LINK

For some reason if link does not work download this pdf and then click